Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. [currently amended] A method for detecting a physiological property of a target tissue, comprising: noninvasively inducing a detectable tissue displacement at a central nervous system (CNS) target tissue site by applying an ultrasound pulse; noninvasively [acquiring data relating to] determining the induced tissue displacement at or in proximity to the CNS target tissue site; and relating the [acquired data relating to the] induced tissue displacement with a physiological property of the CNS target tissue[, wherein said target tissue is selected from the group consisting of CNS tissue, heart tissue, and peripheral nervous system tissue].

2. (currently amended) A method of claim 1, wherein [the data acquired relating to] the induced tissue displacement is determined using [relates to] an acoustic property of the target tissue.

3. (currently amended) A method of claim 2, wherein the [data acquired relating to the] induced tissue displacement is [acquired] determined by administering a plurality of acoustic interrogation pulses to the target tissue site and collecting acoustic data from the target tissue site.

4. (currently amended) A method of claim [2] 3, wherein the acoustic data relates to at least one of the [magnitude,] amplitude, [and] phase and frequency of acoustic scatter.

5. (currently amended) A method of claim [1] 2, additionally comprising collecting acoustic data relating to the induced tissue displacement from the target tissue site using an ultrasound transducer operating in at least one of the following modes: transmission mode, reflection mode, scatter mode, backscatter mode, emission mode, echo mode, Doppler mode, color Doppler mode, harmonic or subharmonic imaging modes, a-mode, b-mode or m-mode; and correlating the acoustic data relating to the induced tissue displacement with a physiological property of the target tissue.

6. [CANCELED]

7. (currently amended) A method of claim 1, wherein [the target tissue is CNS tissue, and] the physiological property detected is intracranial pressure.

8. (currently amended) A method of claim 1, wherein [the target tissue is CNS tissue, and] the physiological property detected is cerebral perfusion pressure.

9. (original) A method of claim 1, wherein the target tissue includes or is in proximity to a blood vessel and the physiological property detected is arterial blood pressure.

10. (currently amended) A method of claim 1, wherein [the target tissue is CNS tissue, and] the physiological property detected is selected from the group consisting of: vasospasm, stroke, local edema, infection, vasculitus, subdural or epidural hematomas, subarachnoid hemorrhages, ischemic conditions, multiple sclerosis, Alzheimers disease, hypoxic conditions, intracerebral hemorrhage, tumors and other intracranial masses, and acute, chronic and traumatic cranial conditions and injuries.

Claims 11 – 12 [CANCELLED]

13. (currently amended) A method of claim 1, wherein the [data relating to the] induced tissue displacement is [acquired] determined using a detection technique selected from the group consisting of: near infrared spectroscopy (NIRS), optical coherence tomography (OCT), magnetic resonance techniques, and positron emission tomography (PET).

14. (currently amended) A method of claim 1, additionally comprising comparing the [acquired data relating to the] induced tissue displacement with an empirically determined standard.

15. (currently amended) A method of claim 1, additionally comprising [acquiring multiple data sets, each data set relating to] determining the induced tissue displacement at different points in time relative to the [application of the acoustic radiation force] inducement of a measurable tissue displacement.

16. (original) A method of claim 1, additionally comprising inducing tissue displacement at a second target tissue site different from the first by applying a second ultrasound pulse, acquiring data relating to the induced tissue displacement at or in proximity to the second target

tissue site, and comparing the acquired data relating to the tissue displaced at the target tissue site with the acquired data relating to the tissue displaced at the second target tissue site.

17. (currently amended) A method of claim 1, [wherein the target tissue is CNS tissue, and wherein the data acquired relating to the induced tissue displacement relates to an acoustic property of the target tissue,] additionally comprising conducting an initial environmental assessment to evaluate the characteristics of the environment between an acoustic source and the target tissue site.

18. (original) A method of claim 1, additionally comprising acquiring data relating to intrinsic tissue displacements at the target tissue site at multiple time points over the course of at least one cardiac cycle, and correlating the acquired data relating to the intrinsic tissue displacements and the induced tissue displacement at the target tissue site with a physiological property of the target tissue.

19. (currently amended) A method of claim 1, additionally comprising applying a plurality of different ultrasound pulses to the target tissue site and [acquiring data relating to] determining the tissue displacements induced by the different ultrasound pulses.

20. (currently amended) A method of claim 1, additionally comprising applying a plurality of ultrasound pulses to the target tissue site at a plurality of times and [acquiring data relating to] determining the induced tissue displacements.

21. (currently amended) A method of claim 1, additionally comprising applying a plurality of ultrasound pulses to a plurality of target tissue sites and [acquiring data relating to] measuring the induced tissue displacements at the plurality of target tissue sites.

Claims 22 – 34 [CANCELLED]

35. (currently amended) A method for assessing a physiological parameter of a CNS target tissue comprising: applying focused ultrasound and inducing oscillation of the CNS target tissue; measuring at least one of the frequency and amplitude of an acoustic signal emitted from the CNS target tissue; and relating at least one of the frequency and amplitude of the emitted acoustic signal to a physiological [tissue] property of the CNS target tissue.

36. (currently amended) A method for [monitoring] assessing intracranial pressure (ICP) in a subject, comprising: administering acoustic interrogation signals to a target CNS tissue site in the subject; detecting at least one of an acoustic emission, an induced and an intrinsic target tissue displacement based on [acquiring] acoustic [scatter] data acquired from the target CNS tissue site; determining the arterial blood pressure (ABP) of the subject; and relating [the acquired acoustic scatter data] at least one of the acoustic emission, the induced and the intrinsic target tissue displacement and ABP with ICP.

37. (currently amended) A method of claim 36, additionally comprising [relating] processing the acoustic scatter data to assess the stiffness or elasticity of the target CNS tissue and relating the stiffness or elasticity of the target tissue with ICP.

38. (original) A method of claim 36, additionally comprising comparing the ICP and ABP and determining the autoregulation status of the patient.

39. [currently amended] A system comprising an acoustic source and an acoustic detector, the acoustic source and detector being operably connected to a power source, the power source being operably connected to a function generator, and the function generator being operably connected to a controller having data acquisition, storage and analysis capability, the controller having the capability to process acquired acoustic data, make determinations of at least one of acoustic emission properties, induced and intrinsic tissue displacements and relate [acquired acoustic data] the determination of at least one of acoustic emission properties, induced and intrinsic tissue displacement(s) with at least one physiological tissue condition of a CNS target tissue [selected from the group consisting of CNS tissue, heart tissue and peripheral nervous system tissue], [and] the controller being operably connected to a display device for displaying information relating to the at least one physiological tissue condition.

40. (original) A system of claim 39, wherein an acoustic source and an acoustic detector are provided as an ultrasound transducer.

41. (original) A system of claim 39, comprising multiple ultrasound transducers.

42. (original) A system of claim 41, wherein the multiple ultrasound transducers are annular.

43. (original) A system of claim 39, wherein an acoustic source and detector is provided as a transcranial Doppler device.

44. (original) A system of claim 39, wherein the display device provides information relating to the ICP, ABP and autoregulation.

45. [CANCELLED]

46. [currently amended] A method for localizing a physiological condition or biological response in a subject comprising: administering ultrasound pulses to a plurality of targeted tissue sites in the subject using a focused acoustic probing technique, and acquiring data relating to [the] a physiological condition or biological response induced by the ultrasound pulse(s) at each of the targeted tissue sites[; and].

47. (original) A method of claim 46 wherein the physiological condition or biological response is pain and data is acquired by observing the subjective sensation of pain induced, or not, upon application of an ultrasound pulse to each of the targeted tissue sites.

48. [currently amended] A method of claim 47 [for localizing the source of pain in a joint] wherein the plurality of targeted tissue sites in the subject includes at least one site in the area of a joint.

49. (currently amended) A method of claim [47] 46 for localizing a source of pain and diagnosing a condition selected from the group consisting of: appendicitis, cholecystitis, pelvic inflammatory disease, lymphadenopathies, anthrax infection, and peripheral nerve-related conditions.

50. [currently amended] A method for assessing a physiological property of a CNS target tissue, comprising the steps of:

(a) acquiring acoustic data relating to intrinsic tissue displacements at [a] the CNS target tissue site at multiple time points over the course of at least one cardiac cycle; and

(b) relating the [acoustic data] intrinsic tissue displacements with a physiological property of the CNS target tissue,

wherein said acoustic data is collected by using an ultrasound transducer[, and wherein said target tissue is selected from the group consisting of CNS tissue, heart tissue, and peripheral nervous system tissue].

51. [currently amended] The method of any of claims 50 and 69[-73], wherein said ultrasound transducer operates in at least one of the following modes: transmission mode, reflection mode, scatter mode, backscatter mode, emission mode, echo mode, Doppler mode, color Doppler mode, harmonic or subharmonic imaging modes, a-mode, b-mode or m-mode.

52. [currently amended] The method of any of claims 50 and 69[-73], further comprising the step of acquiring acoustic data at multiple target tissue sites at multiple time points over the course of at least one cardiac cycle.

53. [previously presented] The method of claim 50 wherein the acoustic data acquired relating to the intrinsic tissue displacement at the target tissue site relates to acoustic properties of the target tissue.

54. [currently amended] The method of any of claims 50 and 69[-73], wherein said acoustic data is selected from the group consisting of changes in the amplitude of acoustic signals, changes in phase of acoustic signals, changes in frequency of acoustic signals, changes in acoustic emission signals, changes in length of scattered signals relative to an interrogation signal, changes in maximum and/or minimum amplitude of an acoustic signal within a cardiac cycle, the ratio of the maximum and/or minimum amplitude to that of the mean or variance of subsequent oscillations within a cardiac cycle, changes in temporal or spatial variance of scattered signals at different times in the same location and/or at the same time in different locations, and rates of change of tissue displacement or relaxation.

55. [currently amended] The method of any of claims 50 and 69[-73], wherein said acoustic data is acquired by administering acoustic interrogation pulses to the target tissue site and collecting acoustic scatter data.

56. [previously presented] The method of claim 55 wherein said acoustic scatter data is acquired at a single acoustic frequency.

57. [previously presented] The method of claim 55 wherein said acoustic scatter data is acquired at multiple acoustic frequencies.

58. [currently amended] The method of any of claims 50 and 69[-73], further comprising the step of relating the acoustic data and additional data relating to blood pressure, cardiac and/or respiratory cycles, to a physiological property of said target tissue.

59. [CANCELLED]

60. [previously presented] The method of claim 50 wherein said target tissue includes or is in proximity to a blood vessel and wherein the physiological property detected is arterial blood pressure.

61. [currently amended] The method of any of claims 50[,] and 69 [and 70, wherein said target tissue is CNS tissue and] wherein said physiological property of said CNS tissue is selected from the group consisting of intracranial pressure, cerebral perfusion pressure, vasospasm, stroke, local edema, infection, vasculitus, subdural or epidural hematomas, subarachnoid hemorrhage, ischemic conditions, multiple sclerosis, Alzheimers disease, hypoxic conditions, intracerebral hemorrhage, tumors and other intracranial masses, and acute, chronic and traumatic conditions and injuries.

62. [currently amended] A method according to claim 35, wherein the [target tissue is CNS tissue and the] physiological parameter is ICP.

63. [previously presented] A method of claim 35, wherein inducing oscillation of a target tissue is accomplished by applying a known acoustic radiation force using at least two acoustic sources having frequency modulated output to oscillate the target tissue.

64. [previously presented] A method of claim 35, wherein inducing oscillation of a target tissue is accomplished by applying a known acoustic radiation force using at least two acoustic sources having phase modulated output.

65. [currently amended] A method of claim 50, wherein the [target tissue is CNS tissue and the tissue] physiological property determined is ICP.

66. [currently amended] A system of claim 39, wherein the controller is capable of [processing acoustic data acquired from CNS target tissue and] relating the [acquired acoustic data] tissue displacement(s) to at least one of ICP, arterial blood pressure (ABP) and cerebral perfusion pressure (CPP).

67. [currently amended] A system of claim 39, wherein the controller is capable of [processing acoustic data acquired from CNS target tissue and] relating the [acquired acoustic data] tissue displacement(s) to intracranial pressure (ICP).

68. [currently amended] A system of claim 67, wherein the controller additionally acquires [is capable of processing acoustic data acquired from CNS target tissue and arterial] blood pressure [(ABP)] data and [relating] relates the [acquired acoustic data] tissue displacement and [ABP] blood pressure data to ICP.

69. [currently amended] A method for assessing a physiological property of a CNS target tissue, comprising the steps of:

(a) acquiring acoustic data relating to [a biological response of an intrinsic or induced tissue displacement] at least one of changes in local perfusion rate, blood flow velocity, and electrophysiological activity using an ultrasound transducer; and

(b) relating the acoustic data with a physiological property of the CNS target tissue[, wherein said target tissue is selected from the group consisting of CNS tissue, heart tissue, and peripheral nervous system tissue].

Claims 70 – 73 [CANCELLED]

74. [previously presented] A method for assessing a physiological parameter of a target tissue comprising: characterizing the acoustic propagation environment by conducting an initial environmental assessment to determine the location and properties of tissue between an acoustic source and the target tissue; applying a known acoustic radiation force using at least one acoustic source to oscillate the target tissue at a desired target location; examining at least one aspect of the acoustic emission from the vibrated target tissue or fluids in proximity to the target tissue; and determining a tissue property as a function of at least one property of the acoustic emission.

75. (new) A method of claim 3, wherein the acoustic data relates to at least one parameter selected from the group consisting of: changes in the amplitude, phase or frequency of acoustic

signals; changes in length of scattered acoustic signals relative to interrogation pulses; changes in primary and/or other maxima and/or minima amplitudes of an acoustic signal within a cardiac and/or respiratory cycle; ratios of the maximum and/or minimum amplitude to the mean or variance or distribution of acoustic signals within a cardiac cycle; and changes in temporal or spatial variance of scattered acoustic signals at different times in the same target tissue or at the same time in different target tissues.

76. (new) A method of claim 3, wherein the induced tissue displacement is determined using at least one parameter selected from the group consisting of: a component of amplitude of the induced displacement; a rate of change of the displacement or subsequent relaxation of the target tissue; an amplitude or rate of change of a component of the shape of the induced displacement; a change in Fourier or wavelett representation of an acoustic scatter signal associated with the induced displacement; a property of induced second harmonic deformation; and time displacements of pulse echoes returning from the target tissue.

77. (new) A method of claim 36, wherein the acoustic scatter data is acquired by administering a plurality of acoustic interrogation pulses to the target tissue site and collecting acoustic data from the target CNS tissue site.

78. (new) A method of claim 36, wherein the data relates to at least one of the magnitude, amplitude and phase of acoustic scatter.

79. (new) A method of claim 36, wherein the acoustic scatter data is acquired using an ultrasound transducer operating in at least one of the following modes: transmission mode, reflection mode, scatter mode, backscatter mode, emission mode, echo mode, Doppler mode, color Doppler mode, harmonic or subharmonic imaging modes, a-mode, b-mode or m-mode

80. (new) A method of claim 36, additionally comprising acquiring multiple data sets, each data set relating to the acoustic scatter at different points in time.

81. (new) A method of claim 36, additionally comprising conducting an initial environmental assessment to evaluate the characteristics of the environment between an acoustic source and the target tissue site.

82. (new) A method of claim 36, additionally comprising acquiring data relating to tissue displacements at the target tissue site at multiple time points over the course of at least one cardiac cycle.

83. (new) A method of claim 36, additionally comprising applying a plurality of ultrasound pulses to a plurality of CNS target tissue sites and acquiring data relating to the tissue displacements at the plurality of target tissue sites.

84. (new) A method of claim 36, wherein the acoustic data relates to at least one parameter selected from the group consisting of: changes in the amplitude, phase or frequency of acoustic signals; changes in length of scattered acoustic signals relative to interrogation pulses; changes in primary and/or other maxima and/or minima amplitudes of an acoustic signal within a cardiac and/or respiratory cycle; ratios of the maximum and/or minimum amplitude to the mean or variance or distribution of acoustic signals within a cardiac cycle; and changes in temporal or spatial variance of scattered acoustic signals at different times in the same target tissue or at the same time in different target tissues.

85. (new) A method of claim 36, wherein the induced tissue displacement is determined using at least one parameter selected from the group consisting of: a component of amplitude of the induced displacement; a rate of change of the displacement or subsequent relaxation of the target tissue; an amplitude or rate of change of a component of the shape of the induced displacement; a change in Fourier or wavelett representation of an acoustic scatter signal associated with the induced displacement; a property of induced second harmonic deformation; and time displacements of pulse echoes returning from the target tissue.

86. (new) A method of claim 46 wherein at least one of the plurality of targeted tissue sites is selected from the group consisting of: the abdomen, the pelvic area, a lymph node, central nervous system tissue, peripheral nervous system tissue, the spine, and joints.

87. (new) A method of claim 46, wherein data is acquired by monitoring one or more physiological responses or indicia of pain.

88. (new) A method of claim 46, wherein ultrasound pulses are administered in association with an invasive or semi-invasive apparatus.

89. (new) A method of claim 46, wherein the plurality of targeted tissue sites are within a generalized site of undifferentiated pain.

90. (new) A method of claim 46, additionally comprising using a diagnostic imaging technique to spatially identify the site of the focused acoustic probe.

91. (new) A method of claim 46, additionally comprising using a diagnostic imaging technique to spatially identify the site of the physiological condition or biological response induced by the focused acoustic probing technique.

92. (new) A method of claim 35, additionally comprising characterizing the acoustic propagation environment prior to applying focused ultrasound by conducting an initial environmental assessment to determine the location and properties of tissue between a source of the focused ultrasound and the CNS target tissue.

93. (new) A method of claim 35, additionally comprising relating the amplitude of an acoustic emission to ICP.

94. (new) A method of claim 93, additionally comprising relating the amplitude of an acoustic emission to a property selected from the group consisting of: tissue stiffness, Young's modulus and shear modulus, which are empirically related to ICP.

95. (new) A method of claim 50, additionally comprising comparing the intrinsic tissue displacements with an empirically determined standard.